

Investigations on tree species suitable for the recultivation of degraded land areas in Central Amazonia*

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The Brazilian-German research cooperation on growth and wood formation of native tree species of Central Amazonia is part of the development of sustainable landuse systems in this region. Especially for the recultivation of degraded land areas, a small portion of long-lived trees for high quality timber production might contribute to the stabilization of mixed culture plantation systems. For most of the tree species used for timber production in the Manaus region, only few informations on growth and site demands for high quality timber production are available. Therefore, in this project the influence of site conditions of degraded land areas on growth and wood formation of 8 selected native tree species (*Swietenia macrophylla*, *Carapa guianensis*, *Cedrela odorata*, *Dipteryx odorata*, *Hymenaea courbaril*, *Ceiba pentandra*, *Virola surinamensis*, *Tabebuia heptaphylla*) are investigated. As to study the influence of the management of degraded areas on growth and wood formation of the tree species, the investigations on the environment-tree growth relationship are carried out in three different plantation systems (monoculture system, mixed culture system, enrichment of a 25 years old secondary forest) established in 1992/1993 at the CPAA/EMBRAPA, Manaus. Due to the specific site conditions of degraded land areas, the investigations are carried out with special reference to the mineral element and water supply of the trees. Therefore, in all experimental plots meteorological data, the element input, the element output, the water input, and the water output of the plant systems are registered continuously since June 1995. The demand of different plant tissues and meristems for mineral elements is studied by bulk and subcellular element analysis. The water conducting system of the trees is investigated by morphological and anatomical investigations, as well as by sap flow measurements. The biomass production of the trees is quantified annually. The intraannual growth dynamics of the trees is characterized by lifecycle analysis of leaves and roots, as well as by the study of cambial growth dynamics dated by pin-marker technique. Furthermore, studies on parameters suitable for the prognosis of wood properties which might be expected in the future are carried out. From these investigations some practical help for the selection of tree species for high quality timber production in mixed culture plantation systems on degraded land areas are expected with special regard to ecological and economic aspects.

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